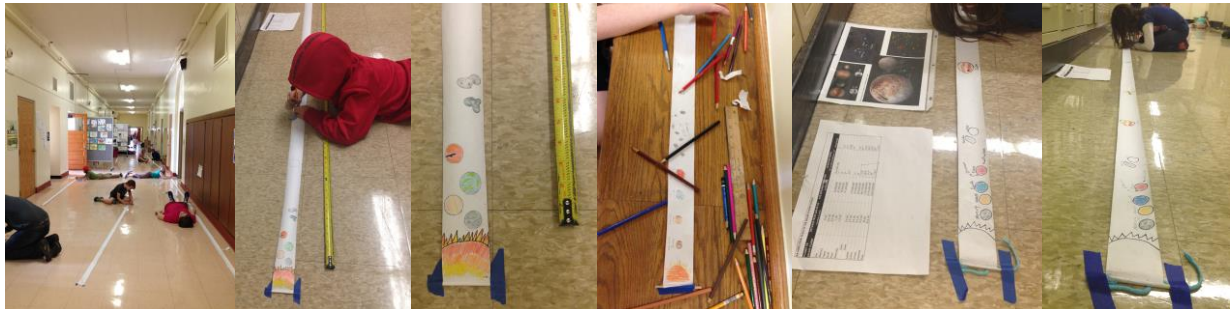


SOLAR SYSTEM SCROLL

Exploring the scale of the solar system with a new artistic twist!



THE ACTIVITY

This lesson is ideal outdoors in a large space, or down a long hallway. Students will create a scale model of the solar system using adding machine tape (sketch-able, roll-able, affordable). Making comparisons to the distance between solar system objects with their own bodies will help make the lesson personally relevant. Use a long tape measure or mark with steps.

In this activity, one Astronomical Unit (AU), the distance between the Sun and the Earth (~150,000,000 km) equals 10 centimeters: 1 AU = 10 cm

- This activity illustrates scale of distance between Solar System bodies, but not their size relative to each other—Dawn mission's [Where Are You?](#) activity helps illustrate both.
- Students can use different sized circles to symbolize relative size, though they will not be able to illustrate that comparison fully within the width of the adding tape.

SUPPLIES

- | | |
|---|---|
| -Adding machine tape (~10 students/roll) | -Wooden skewers |
| -Craft glue or hot glue or Two sided tape | -Meter measuring tape |
| -Rulers or measuring tape | -Small circle templates (coins or lids) |
| -Fine tip sharpies or markers | -Colored pencils |
| -NASA Global planet images | -Ribbon or Yarn |

Material preparation

1. Cut adding machine tape to 4.2 meters (14 ft.) lengths
 - a. One/student or team (though kids love to take home their own SS model)
2. Cut wooden cooking skewers to 14 cm length.

Student Activity

1. Glue wooden skewers to the ends of the adding machine tape by putting a small bead of glue, or a strip of two sided tape,
 - a. Roll the paper around the skewer a little to secure.
 - b. Tape wooden ends of scroll to long tables or floor with blue, painter's tape or masking tape (tape that holds yet comes up easily)

2. Have students draw the Sun in pencil near the base of the scroll.
 - a. The center of their Sun marks 0 AU.
3. Students use a ruler or measuring tape to mark 10 cm increments with their pencil, recording the numbers to the scroll as they move from the Sun:
 - a. 20 cm = 2 AU, 30 cm = 3 AU, etc.
 - b. This will help them count out the distance in cm for the outer solar system
4. Have students measure 1AU and make a mark for Earth
5. Using the Solar System Chart, students make marks for the other planets, asteroids and dwarf planets on the scroll at the correct scale
 - a. Noting distance in both AU and cm
 - b. As a math extension, task students to research and develop their own conversions

The Art of Science

6. Students can use circle templates to trace their planets
 - a. small coins and lids less than 4 cm work great
 - b. Templates should be less than 4 cm in diameter to ensure Mercury and Venus can be drawn between the Sun and Earth on the scroll.
7. Using sharpies and colored pencils to draw and color the planets, asteroids and dwarf planets.
 - a. Use NASA prints or NASA image searches to research what the worlds look like
 - b. Label the name of the worlds and distance in both AU and cm
8. This is ART! Be creative. Add your own details: NASA missions at different bodies, even major moons and asteroids/dwarf planets

Wrap-Up

9. Students reflect upon their own findings and look at other projects and discuss their observations, questions and revelations about the scale of the solar system.
 - a. They may write a paragraph reflects upon and synthesizes their discoveries
 - b. Writing *Two Stars and a Wish* on sticky notes can be an effective protocol to foster a supportive and observant peer-peer critiquing process
10. Carefully roll scrolls. Tie with a ribbon or yarn to take home a space keep sake.

SCALE OF THE SOLAR SYSTEM SCROLL CONVERSION CHART				
PLANETS & SMALL BODIES	AVE DISTANCE FROM SUN In Astronomica Units (AU) rounded to tenths	AVE DISTANCE From Sun In Miles	SCALE FOR SCROLL <i>Metric in cm</i> 1 AU = 10 cm	SCALE FOR SCROLL <i>in inches</i> 1AU = 3"
Sun	0 AU		0 cm	0"
Mercury	0.4 AU	36,000,000	4 cm	2"
Venus	0.7 AU	67,200,000	7 cm	3"
Earth	1 AU	93,000,000	10 cm	4"
Mars	1.5 AU	141,600,000	15 cm	6"
Asteroid Belt	1.8 - 4.5 AU		18 - 45 cm	7-18"
Vesta	2.4 AU	219,000,000	24 cm	9.5"
Ceres	2.7 AU	257,000,000	27 cm	11"
Jupiter	5.2 AU	483,600,000	52 cm	20"
Saturn	9.5 AU	886,700,000	95 cm	37"
Uranus	19.2 AU	1,784,000,000	192 cm	75"
Neptune	30.1 AU	2,794,400,000	301 cm	118"
Pluto	39.5 AU	3,674,500,000	395 cm	155"